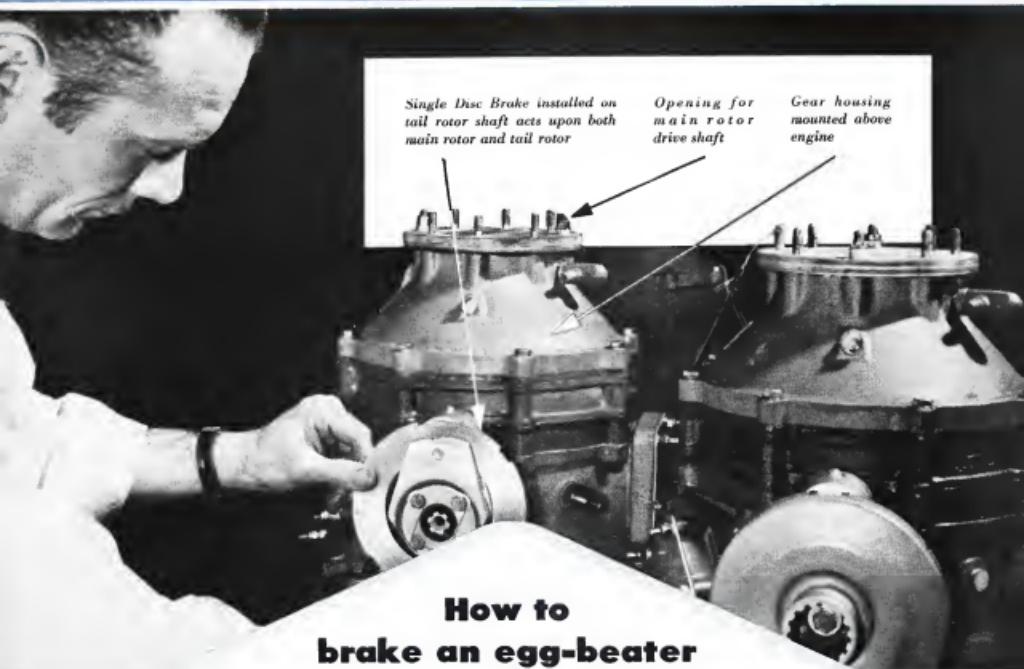


# AVIATION WEEK

A McGRAW-HILL PUBLICATION

JUNE 27, 1949



## How to brake an egg-beater

To prevent the main rotor and tail rotor from windmilling and to provide sure, smooth action and controlled deceleration necessary to prevent damaging torque stress loadings on rotor assemblies, the Bell 47-D helicopter is equipped with the new Goodyear Single Disc hydraulic rotor brake.

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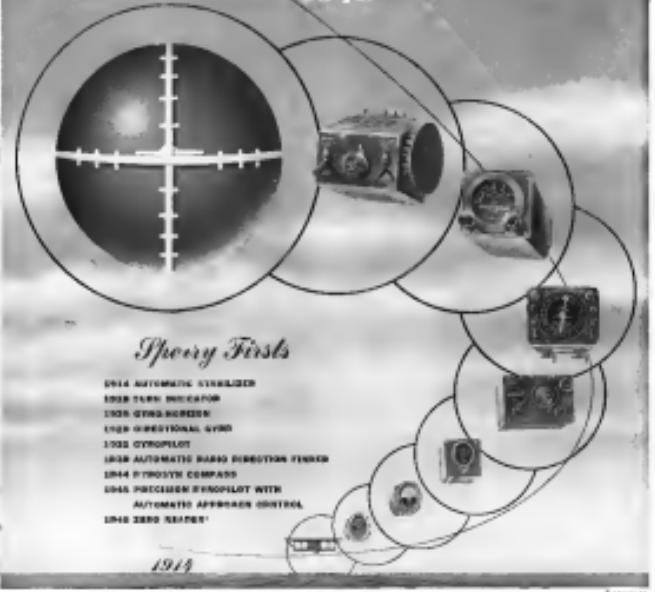


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1948



# ZERO reader—ANOTHER SPERRY "FIRST"

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## NEWS SIDELIGHTS

### Military Charges

On the military front, the House Committee recommended a vast increase in the Secretary of Defense's control over the services to promote uniformity. The National Military Establishment would be converted into a centralized executive department, the Department of Defense. Legislation creating the proposed defense organization, with some modifications, has been passed by the Senate [AVIATION WEEK, June 6].

These Armed Services Committee's chairman, Rep. Carl Vinson, (D., Ga.), was set to propose it. But shortly after the legislation giving the President new commanding authority was passed, Vinson announced hearings on the defense measure starting June 25. It was then clear that the President could accomplish the military reorganization without the approval of the House. Armed Services Committee Vinson's only chance now to defeat it is to whip up enough votes in the House from the President's proposals.

### Tactical Demand

Watch for Air Force to make strong our efforts to build up its tactical air power during the next fiscal year. Army is putting strong pressure on USAF to get adequate air support for its ground troops. USAF has been relying on the resources of Army bases, Com. Gen. Bradley for the 2nd Corps, has been against the Navy's plan to build up its own air force.

Once USAF achieves its own air power for Army support it may lose the decisive Army role in JCS. Both the Lockheed F-100 and Republic F-105 have shown up extremely well in a variety of dive-bombing and strafing of ground targets, but they lack the endurance required for an effective ground support plane that must remain in the target area for some time to deliver sustained attacks. "Tremendous progress" now possible in attack planes has the Army hoping for USAF procurement of a medium attack plane.

### Research Policy

Military and industry leaders are alarmed at the current Congressional trend toward heavy slashing of research and development funds. Congress seems to feel that the big need for aviation research and development ended with the war and that all species concerned can coast along on a wartime backlog of research. Among the various groups, Na-

### Wreck Missiles

Watch for the for to fly when Dr. Clark Millikan, newly-appointed chairman of the Research and Development Board's panel, meets committee leaders carrying the military missile program. Most observers consider the missile program must go on, regardless of cost evaluation, and that Millikan is a good choice to do the job.

One of the big problems in getting out a series of surface-to-surface missile projects that still continue even though technical progress has indicated they no longer offer much promise. Typical of these is the program on missiles proposed to intercept.

Also needed is a more thorough evaluation of the missile programs now being conducted by U. S. Air Force, Navy Bureau of Aeronautics and Bureau of Ordnance and the Army's Ordnance Department.

holding not the top job in Washington," the article asserts in its opening paragraph. The aircraft maker is presented as an influential spokesman by the industry. He suggests the industry with his times, presenting possible bases for executive but not for himself. He gets underway, says, "now we are more popular, and the industry is trying to take every last ounce—screeching to 'Anacrusis'."

### B-36 Expert

Washington observers are wondering whether Charles E. Lindbergh will be one of the witnesses called when the House Armed Services Committee opens its investigation into the Convair B-36 and other "convoluted" matters.

Lindbergh recently spent some time at Convair's Ft. Worth plant in his capacity as a spokesman for USAF. Chief of Staff Gen. Hoyt S. Vandenberg, while at Ft. Worth, Lindbergh flew the cockpit of the B-36 prototype, equipped with four Allison turboprop engines and an Pratt & Whitney Wasp Major piston engine.

Convair test pilot B. A. Erickson flew in the left-hand seat as the B-36D test hop during which considerable time was spent above 40,000 ft. Lindbergh is now inspecting USAF bases in Germany.

### Emergency Drive

The move to slash military funds [AVIATION WEEK, June 6] was in full swing in the Senate last week as the Appropriations Committee opened hearings on the 1950 fiscal year budget for the services.

Sen. Elmer Thomas (D., Okla.), chairman of the armed services appropriations subcommittee, called for an overall \$1 billion slash in the \$3.5 billion military allocation voted by the House. He advocated the major reduction in Air Force funds, proposing a 50-group program for the coming year, instead of the 35 groups that were approved by the House. The Thomas plan was recommended by the Budget Bureau.

Any gross advocate of the subcommittee, however, can be counted on to fight any slash outlined in USAF funds. These include Sen. Baruch (New York), Sen. Hill (D., La.), Styles Bridges (N. H.), and Sen. McCarran (D., Nev.). The subcommittee appears set to drop the \$100 million approved by the House for the Navy's supercarrier United States, since directed by the House Select Committee on Appropriations to cut the ship's cost.

# Safeguarding Aircraft Electrical Systems



Phase shows how much protection is provided for the E26 with the combination of buried tape and insulation.

As a safeguard or flight, today's modern aircraft electrical systems in Barnard-Linser protected these vital aircraft "lines" carry temporary overloads but clear promptly under short circuits. They are particularly recommended for systems which use multiple conductors per phase run, when Linser protection, a fault on a single wire is cleared without interruption of current in that leg of the circuit.

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## AVIATION CALENDAR

June 19-22—Annual meetings of Naval Ordnance Laboratories and Naval Ordnance Systems, Inc. and their contractors. Naval Ordnance Test Station, White Oak, Md.

June 23-July 1—1980 Annual General Meeting American Society of Mechanical Engineers, University of California, Berkeley, Berkeley, Calif. President of ASME: Freeman Hrabowski.

Aug. 1-2—(2nd annual) medical symposium and review Air Force Area, Brooks Air Force Base, Tex.

Aug. 4—Florida State Air Show

Aug. 4-5—T-38/Hypersonic International 40th annual Williams Advanced Research

Aug. 2-9—National meeting, American Institute of Physics, New York, N.Y.

Aug. 10-12—National Air Fair Ground, Atlanta, Ga.

Aug. 12-13—Second Joint meeting, Institute of Aerodynamics and Propulsion, The Royal Society of America, Washington, D.C.

Aug. 14-17—Annual meeting, Naval Air Warfare Division, University of Southern California, Los Angeles, Calif.

Aug. 14-16—National Assoc. of State Aviation Officials annual meeting, Indianapolis, Ind.

Aug. 14-16—(2nd annual) summer meeting, Air Mobility, Los Angeles.

Aug. 14-16—1980 West Coast meeting, International Petroleum Aircraft Show, Calif.

Aug. 15-16—Flying Fortune annual convention, Port Clinton, Ohio.

Aug. 19-20—(2nd annual) meeting, American Institute of Physics, University of Southern California, Los Angeles, Calif.

Aug. 20-22—International conference of Fluids—Advances in Aerodynamics, International Woods-Park Motor Circuit, Cleveland, Ohio.

Aug. 20-24—1980 National Air Shows, Cleveland, Ohio.

Aug. 20-24—(2nd annual) meeting, American Institute of Physics, University of Southern California, Los Angeles, Calif.

Sept. 1-2—1980 meeting, British Aircraft Owners and Pilots Association, Farnborough, England.

Sept. 1-11—China on exhibition of India and Pakistan, International University of Nanking, Nanking, China.

Sept. 16-20—(2nd annual) meeting, American Institute of Physics, University of Southern California, Los Angeles, Calif.

Sept. 18-20—(2nd annual) meeting, American Institute of Physics, University of Southern California, Los Angeles, Calif.

Sept. 20-21—(2nd annual) meeting, American Institute of Physics, University of Southern California, Los Angeles, Calif.

Sept. 21-22—(2nd annual) meeting, American Institute of Physics, University of Southern California, Los Angeles, Calif.

Sept. 22-24—(2nd annual) meeting, American Institute of Physics, University of Southern California, Los Angeles, Calif.

Sept. 24-26—(2nd annual) meeting, American Institute of Physics, University of Southern California, Los Angeles, Calif.

Sept. 26-Oct. 1—(2nd annual) meeting, National Institute of Space Research, Rio de Janeiro, Brazil.

Sept. 28-Oct. 1—(2nd annual) meeting, American Institute of Physics, University of Southern California, Los Angeles, Calif.

Sept. 29-Oct. 1—(2nd annual) meeting, American Institute of Physics, University of Southern California, Los Angeles, Calif.

Sept. 30-Oct. 1—(2nd annual) meeting, American Institute of Physics, University of Southern California, Los Angeles, Calif.

Oct. 1-14—1980—(2nd American) Air Shows, Miami, Fla.

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## CAA Plans \$213 Million Airways Program

Three-year development effort will fulfill ICAO interim phase outline.

By Robert Blots

Civil Aerospace Administration has blueprinted a three year program for spending \$213 million on electronic airways equipment. This represents CAA's part in the post civil military program for establishing an all-weather airways and traffic control system for the United States and the main areas referred to in the ICAO outline.

The CAA target equipment program involves \$30.6M in the final 1969 (approximately still pending before Congress plus \$102.9M, 60/40 to be implemented in the fiscal 1971 and 1972 CAA budgets. These funds will be used to purchase electronic equipment as indicated in the following table. This equipment will be used to complete the interim phase of the all-weather airways program as outlined in the SC 31 report of the Radio Technical Commission for Aeronautics.

► **Home's Plans—Details on CAA's overall airways planning** was revealed to AVIATION WEEK by Charles B. Horne, formerly head of the CAA's Civil Federal Airways Division, Washington, D.C. Horne was assigned to the airways unit by CAA Administrator DeLo W. Roetert to work the new airways development program.

Horne came to CAA after a career in Navy communications and electronics during World War II. During the war he was staff communications officer for Admiral Halsey in the South Pacific and later for Admiral Kefler Turner commanding the amphibious forces in the Central Pacific. After the war Horne was Deputy Director of Naval Communications and was a passed CAA testee in Roetert's special advisor on electronics.

Horne indicated that if the airways program were fully implemented according to schedule it would be possible to have the interim system operating for civilian, private pilots and military aircraft by the winter of 1973-74. Status of the new airways equipment installations program as of June 1 is shown in table as opposite page.

### Airways Progress Report

Facility	Total Progressed	
	In Operation as of 6/1/69	Through Final Year 1972
VGR (Interim-Map)	294	409
Instrument Landing Systems	92	153
High Intensity Approach Lights	4	323
Airport Surveillance Radar	3	150
Precision Approach Radar	3	82
Distant Measuring Equipment	3	731
ATC Towers	147	203
ATC Centers	38	38
Airways Communication	196	418

### Implementation Schedule

Classification	Fiscal Year 1969	1970	1972
Basic Instrument Air Terminal Area	227	118	120
Class D	0	9	117
Class C	0	79	51
Class B	0	51	65
Class A	35	64	82
Total	246	284	440

The planned airways installation program is about three-quarters complete. There are indications that one more year of work may be required on the current range to improve the accuracy of the airways as planned.

► **GCA Progress—ILS is now in operational status at 92 airports. First installations of traffic control search radar and precision beam approach radar (GCA) specifically designed for civil airport use will be made before the end of 1969.**

Many items during the final half of this year will be concentrated on push the distance measuring equipment (DME) out of the developmental stage into widespread production. International agreement on DME specifications was obtained at the recent ICAO meeting in Paris, June 11-13. Montreal U.S. development DME committee, working together with Marconi Electronics Corp. and Federal Telecommunications Laboratories, is now being modified to meet the international specifications.

► **DME Tests**—In the fall a year CAA Air Force-DME program will begin to give the modified interim DME equipment

a thorough service testing on the three general DME stations now in operation at Wright Field, Indianapolis and Patuxent River, Md.

The DME tests are expected to provide data for evaluation of the hardware equipment and for writing of detailed production specifications for electronic range-finders. Production quantities of surface DME equipment will probably not be available to civilian and military users until late next year or 1970.

► **Repeater DMEs**—Ground stations, of which 729 are planned in the CAA program, will be located at the ends of all airways ranges and at the ends of instrument landing runways. These new DME installations will eventually replace the ILS 75 wavelength marker beacons to indicate an approaching plane's distance from the runway's end.

Some work is expected to be done on high-speed airborne DME equipment for small twin-engine-type planes but the cost and technical problems involved now indicate a limited market for this equipment.

► **Surface Planning**—Home indicated that basic CAA planning for the new

### CAA Airways Program

Type of Facility	Total CAA number of facilities	Authorized through fiscal year 1968, number of facilities	Total 1969 program		Expenditure for years fiscal years 1951 and 1952
			Number of facilities	Amount	
<b>Continental United States.</b>					
VFR (Interim-Map)	126	117	10	\$4,254,800	146 \$24,216
Instrument Landing Systems	126	12	107	295,000	414,250
High Intensity Approach Lights	508	51	51	1,941,220	1,941,220
Distant Measuring Equipment	72	1	72	1,000	1,000
Precision Approach Radar	11	13	13	2,400,000	15,611,372
Airport Surveillance Radar	155	25	14	4,312,000	10,781,781
Boundary Radar	150	—	44	481,392	1,797,318
VFR (ADT) equipment	106	403	—	—	239,946
VFR (Interim-Map)	50	8	40	641,200	1,248,219
Mechanical repeaters	90	—	—	—	1,200,000
Airways route indicators	30	6	15	491,000	31,151,300
Airways control center devices	—	—	—	—	—
<b>Alaska</b>					
VFR (ILS equipment (includes LF lowered))	16	7	4	980,000	8,921,259
High Intensity Approach Lights	29	—	—	—	2,000,000
Distant Measuring Equipment	2	—	—	—	1,200,000
Precision Approach Radar	2	—	—	—	2,029,219
Airways route indicators	12	8	12	214,800	2,707,692
Boundary Radar	1	—	—	—	1,200,000
VFR (ADT) equipment	11	—	—	—	1,200,000
VFR (Interim-Map)	6	—	—	—	1,200,000
Mechanical repeaters	—	—	—	—	421,205
Airways route indicators	—	—	—	—	—
Airways control center devices	—	—	—	—	—
<b>Patagonia</b>					
VFR (ILS equipment (includes LF lowered))	8	1	—	—	1,200,701
High Intensity Approach Lights	8	—	—	—	1,200,000
Distant Measuring Equipment	1	—	—	—	1,200,000
Precision Approach Radar	1	—	—	—	1,200,000
Airways route indicators	1	—	—	—	1,200,000
Boundary Radar	1	—	—	—	1,200,000
VFR (ADT) equipment	1	—	—	—	1,200,000
VFR (Interim-Map)	1	—	—	—	1,200,000
Mechanical repeaters	—	—	—	—	1,200,000
Airways route indicators	—	—	—	—	1,200,000
Airways control center devices	—	—	—	—	1,200,000
<b>Caribbean Areas</b>					
VFR (ILS equipment (includes LF lowered))	6	—	—	—	1,117,476
High Intensity Approach Lights	—	—	—	—	1,200,000
Distant Measuring Equipment	12	—	—	—	1,200,000
Precision Approach Radar	1	—	—	—	1,200,000
Airways route indicators	2	—	—	—	1,200,000
Boundary Radar	1	—	—	—	1,200,000
VFR (ADT) equipment	3	—	—	—	1,200,000
VFR (Interim-Map)	6	—	—	—	1,200,000
Mechanical repeaters	—	—	—	—	1,200,000
Airways route indicators	—	—	—	—	1,200,000
Airways control center devices	—	—	—	—	1,200,000
Total	348,445,584	348,445,584	348,445,584	348,445,584	348,445,584

navigation systems was aimed at getting the system from completely conceptual and operating first rather than reaching all of a certain type of equipment all over the country and then moving on to another point of equipment.

This planning aims at releasing the bad weather traffic pattern and congestion at major air terminals first and then working back through the various sectors to segments where lower traffic density make operational problems less evident.

To facilitate the priority program CAA has drawn up an interim airport classification.

► **Basic instrument terminal area** is an airport where instrument approaches can be made using an radio active facilities such as course range and DME. Class D is an airport that has a course range, DME and an instrument landing system (ILS) plus high intensity approach lights.

► **Class C** area has all the Class D equipment plus a traffic control tower.

► **Class B** area is characterized by the addition of traffic control tower and to the above facilities.

► **Class A** area has precision beam approach radar (PBA) in addition to everything provided in a Class B area.

### Brazilian Crash

(McGraw-Hill World News)

RIO DE JANEIRO—All 25 aboard a Brazilian Air Force C-47 died when the craft smashed into a mountain in southern Brazil June 6, one of the world's worst air tragedies.

The plane struck Camboriu Peak in the state of Santa Catarina and burned, just after the pilot had noticed that he was flying an instrument.

All the crewmen were members of the Brazilian Air Force. The 20 passengers were all members of the armed forces except two women and two children.







# ENGINEERING



BRITISH GIANT. 177 ft. Brabazon, world's largest commercial passenger-type plane, is being readied for flight trials. Cost is first of two long lead. Second, turbojet-powered, is slated for 1951 completion, to carry 100 passengers on trans-Atlantic runs.

## Big Bristol Brabazon Nears Flight Stage

First of two 100-passenger transports to be used as research craft. Views vary on plane's feasibility.

(McGraw-Hill World News)

**LONDON**—Following recent news to former flying clubs, it is likely that Britain's giant Bristol Brabazon will become fit for flight by the end of this month.

And it is scheduled to fly in July, unless final checks reveal conditions that make additional work necessary.

► **Net Lagoon**—The 390,000-lb-gross weight of the "Boof" is topped only an instant by the B-164's 328,000, and is also below that of the Hughes flying boat (400,000), but exceeds those of the XG-99 (215,000), Constellation (194,000), French SE 2018 Argosy (161,300) and Soviet-crater (142,000).

Its 200 ft wingspan is equal to that of the XG-99 and B-164; its 177-ft length is 54 ft less than the XG-99; 15 ft more than the B-164.

► **Jet Competition**—Designed to carry 100 passengers in considerable luxury, this ship, from London to New York, is about 12 hr. the Brabazon is Britain's bet that there's room in the air for the counterpart of the "Queen" or the "Giant" by the Soviet Aeroflot Co.

First set of eight were not worn out, or defective, or at any other way at need of change. They had only been on a few hours (relatively). It was surmised that the company felt it would lose nothing to change-as they were considered.

► **Fit for Research**—But the first Brabazon is not intended to carry passengers—certainly not for fun. It is destined to be used entirely for research on the many problems involved

in building aircraft of this size. The giant ship will start taking shape shortly. This craft may be the first of but six to cross the ocean—but probably not until 1951.

It will have one basic variation from the first craft, instead of piston engines, it will have eight gas turbines.

The eight engines, in both pairs, are to be built in the aircraft's four outer nacelles, three-bladed propellers.

A special feature links the engines to the propellers. In effect, one motor drives the forward propeller, another drives the rear prop.

► **Compartmentation**—BOAC, obviously the only potential purchaser for the Brabazon, has the two remaining British air lines, has not settled finally on the interior arrangements. One proposed arrangement is shown in the accompanying sketch.

Storage and mail holds are below the two main cabin decks, clearing room for toilets and holding the dining salons.

Over the dining compartments, red nose and tail, and the bottom main deck, station-arranged, entirely into station-arranged, entirely

forward of the front cabin and immediately aft of the cockpit and flight deck.

► **Passenger Accommodation**—Main passenger compartment, seating about 50 to 60 people, is in the forward part. Since clouds will be the only view from the windows for the greater part of the journey, passengers will be able to follow the officer's route by an illuminated chart on a screen. The compass will also be used for showing section patterns.

More passengers will be accommodated in two smaller compartments, one on each side of the fuselage just ahead of the wings.



ONE INTERIOR ARRANGEMENT for Bristol Brabazon has during cabin and has an extra upper deck, with rest room below. Passenger cabin are located fore and aft, with storage facilities below deck. Accommodations for crew members are behind the control cabin.

► **Double Deck**—Mid section of the fuselage is divided into two similar sections for passengers by a door just behind the wings, opening to a wide staircase leading up to a spacious cocktail lounge. This is fitted with couch seats and the small bar is compactly fitted into the corner.

Beyond is a large dining room with storage and tables for about 30. When meals are not being served it will provide a comfortable and sunny lounge and reading room.

A service hatch opens directly into the kitchen, positioned at the other end of the dining room. On the opposite side of the bridge is the food store, which is also accessible by doorway from the dining room.

► **Airail Makeup**—The wing compass, three sections—a center section at rear wing and two overhead panels.

Extending completely through the fuselage, the outer wing has a span of 100 ft and a maximum depth of approximately 65 ft.

The two outboard panels, each 65 ft long, contain 27 double biplane seats to carry the full load of 15,500 gal. Wing area (gross) is 7,217 sq ft.

► **Passenger Performance**—The 177-ft long aircraft has a maximum distance of 11,000 ft. Speed of the trip will be 75 mph and height over center is 35 ft.

The craft will be pressurized to maintain an equivalent cabin altitude of 8,000 ft while flying at 25,000 ft. It will be hermetically and air-conditioned. In addition to the 100 passengers, it will carry a flight crew of seven and five steward.

► **Estimated Performance**—With gross weight of 390,000 lb., the Mk. I aircraft will have an initial operating ceiling of 21,000 ft., increasing as fuel is consumed, maximum level speed of 300 mph at 25,000 ft., maximum economical economical cruising speed of 190 mph at 25,000 ft., and a rate of climb of 75 ft



CRAFT'S BODUNESS is pointed up in this view of rear compartment. Flying boat in a 100 ft. Construction class conventional belt frame and stringer sailing.



HUGE CRANE raising propellers are driven by coupled Bristol Centaurus piston engines. Second Brabazon will be fitted with Bristol Pacific turbines, have smaller tailfins.

at operating altitudes of 30,000 ft. and above.

► Second Craft Improvements. The second *Belisair*, to be powered by Bristol Centaurus turboprop, will incorporate lessons learned as a result of experience with the first craft.

It is slated to have a clearer configuration, eliminating the external communications dome and external wire harnesses on the cockpit. Main landing gear will retract completely and will obtain small improvements in the landing gear.

And as a result of the turbine engines, will be considerably smaller than the existing design used for the Centaurus powerplants.

## Fire Test Evaluates Aluminum Foil Suit

Putting research to develop a heat and flame protective suit for aircraft fire fighting, the Air Materiel Command recently conducted a test at Wright-Patterson Air Force Base which indicates that an aluminum foil-thermos insulated garment passes flame characteristics.

Five suits under study by the Air Materiel Laboratory were similar in design, differing only in protective protective layer. All were lined with 22-oz. wool-like material for insulation. Components included braided, coat, great coat, helmet with heat-resistant Fiberglas window, and gaiters over neoprene gaiters.

Intended to afford total protection at use against structural fires, the garments were not designed to be worn in flames although this could be done for a short period, in an emergency.

For test purposes, the suits were worn at body temperature to a 2000°F. furnace blast.

Identically, according to protective heat, the garments enabled the wearer to withstand the intense heat for these periods.

► Untested cotton duck (weight—28 oz./sq. ft.) is considered high because water stored at edge of pit, was subjected to heat heat from within.

► Neoprene coated Fiberglas—4 oz./sq. ft. Fire and water proofed cotton duck—25 oz.

► Abromized Fiberglas—31 oz.

► Untested cotton duck—28 oz./sq.

► Abromized Fiberglas (insulated)—45 oz.

With exception of the abromized lined garment, all suits were tested as heated through to the melting point.

Though the endurance periods studied were short for all garments, they undoubtedly would be extended with use of fire hose.

## Joint Air Meeting Gives New Data

IAS-RAS second international conference assembles authorities to exchange wide range of information.

► When you look the class on a research laboratory, you look more advanced than you look in it. With the exception of C. F. Kettering, T. Wright would say "I am not a professor and value of the second international conference recently sponsored jointly by the Institute of the Aeronautical Sciences and the Royal Aeronautical Society in New York.

But the most important that the were exchange of formal papers is the personal contact and working friendships that produce tangible but invaluable benefits to the profession at both nations.

A vital function of the meeting is to bridge the obvious gap in "approaches" between the engineers of the two nations. There seems little question that if the U.S. could use more of the British "passionate" technique, and the British more of the U.S. "engineering" technique, both nations would profit enormously.

► British Approach. The British development of the turboprop is a classic example of the approach in which the problem was attacked by a veritable deluge of prototypes and increasing models hammered out in a prolific and extremely orderly series.

Throughout their extensive turboprop (and turbofan) program, they have taken the mechanical, experimental approach in which the wrench and the eye carry the burden of development, rather than the wind tunnel and computing machines, in the U.S.

Their flight test program has been a parallel and sequential approach with one test aircraft and then another in order to obtain the results of test one before the next another.

The program entails a large quantity of experimental data, though the various points of which a curve can be drawn that is critical in aircraft in the U.S. by comparison. That this computed curve may be off a slight amount is more than justified in the light of the erratic nature of experimental derived curves.

► Our Approach. But upon completion of such an experimental program, the British have a thoroughly tested engine study. For production installation, when the U.S. aircraft would have proceeded with a thoroughly proven program, whose basic arrangement was unique but whose maintenance parts conformed reasonably "tight" that only sources test could cause.

This contrast in approach is justifiably

► The U.S. approach is cheaper, but the British have far less money to spend. Then, the more-power British use the aerospace approach, whereas the aircraft American is the economic approach. Which facilitates more rapid progress is a most question that partnership can not answer.

It is common to assume that the aircraft is the basis of the turboprop development in which has been developed more on the basis of policy than by technical progress. Only in those areas in which both national policies have been the same, such as in turboprop engines and high-speed aircraft, can the relative effectiveness of the two approaches be compared directly. Apparently there is comparatively little to choose between the results of the aerospace development in the U.S. itself, although it is a fact that the U.S. holds both speed and endurance aircraft speed records at the moment.

► Opposing Statements. It is only against this background of a variety of national policies and technical approaches that much of the significance of the Second International Conference can be accurately assessed. For example, both Fred Owen, British, and George Edwards, Villiers Armstrong, expressed the view that their ends in engine compression pressure ratio and blade inlet temperature beyond which compressor fails off. This is a direct contrast to the view of Abe Silvestri, NACA, who believes that the higher the pressure ratio, the greater the resulting efficiency.

Apparent success has been in the speed at which these turbine engines are to be operated. At the 3,400 mph speed on which these were tested British engineers are thinking, their findings is probably quite accurate. But for the transonic speed in terms of which Silvestri is thinking, his findings are also accurate. That the question of design policy determines the outcome of these two statements, and simply the interests themselves.

► Short. There was much that is new at the conference, together with considerable ploughing of old ground, valuable, too, when properly done. A discussion of the effects of high altitude on aircraft stability dynamics was particularly affected by Mr. Philip Tuck, Villiers Armstrong, a mathematician of worldwide repute.

He presented various metal sets of illustrations of very low pressure loss, density, low incidence, contact and extremely



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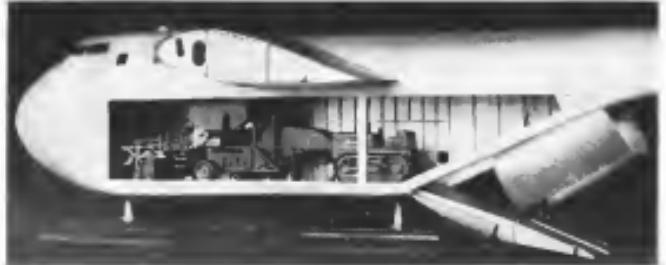


AVIATION SECTION  
**RADIO CORPORATION OF AMERICA**  
COMMUNICATIONS PRODUCTS DEPARTMENT, CLEVELAND, OH.  
In Europe: RCA VICTOR COMPANY UNITED KINGDOM





NOW: FIFTEEN-ton gross weight freighter, shown in model form, a 240 mph maximum speed British "Universal" transporting . . .



CONVENTIONAL "vug tail" cargo profile. Undeveloped cargo hold is shown containing models of lorries and trailers.

## British Approach to 50-Ton Cargo Plane

General Aircraft's "Universal" embodies the classic design criteria which now are being changed in U. S.

By Helen McLaren

The British Blackburn & General Aircraft Co. Ltd.'s "Universal" is a proposed 50-ton gross weight all-cargo design that follows an approach now generally considered out-dated.

Further, the major consideration of cargo craft design was the utilization of sea coast air transportation through seaplane and coastal seaplane.

Most recent experience, together with extensive analysis indicates that high performance often the greater economy.

Evidence available from the Proto-type Evaluation Board studies by Miles

Joint Air Transport Service and numerous individual analyses tend to show that 300, 350, 400 and 500 ton flights as demanded by the customer.

► **Route Patterns**—This is not at "short runways requirements," "low leading speeds," "great lifting capacity," etc., which have often characterized the conventional and pressurized heavier of the all cargo plane, virtually line load, that measure.

All-cargo aircraft have now reached such a state of responsibility, that instead of finding these principal markets in the jungles of Central America or the marsh and valley of Alaska (in which the above specifications were laid down), they are now also flying wing-to-wing with scheduled airways between the 510,000-mile airways of the major cities of the world.

The design objective has been

changed by this design shift as exceptional route pattern. And today's all-cargo craft designer is thinking in terms of 30,000 lb. of payload carried at a speed of 300 mph over a 2,500-mile route.

► **Design Weighted**—It is against this background that the new "Universal" would be considered absurd in this country below its prototype has been built.

This is not to indicate hauls on the part of the General Aircraft design team, who had to meet specifications laid down by the British government. Although this specification, in all probability, has been set as full, it would appear that the specification itself is now so far removed as to no longer commercially sound.

General Aircraft engineers took the classic approach to all-cargo aircraft design, a slow profile with large incidence angle, a slow cruise speed to produce  $L/D_{max}$  engines selected for economic cruise power, with takeoff requirements met by a combination of engines rather than high power engines of lower number, provision of a drag penalty as a charge for simplicity of both production and operational features, and heavy reliance on high lift flap for short range operation at the expense of high rates of climb.

► **Airfoil Details**—The accompanying il-

"Universal" Freighters

4 Board Motors 160  
1600 hp @ 2100 rpm

Dimensions

Span . . . . . 163 ft

Length . . . . . 99 ft. 3 in.

Height . . . . . 31 ft.

Wing area . . . . . 2916 sq. ft

Weights

Empty weight . . . . . 67,500 lb

Freight . . . . . 13,600 lb

Gross weight (max) . . . . . 179,200 lb

Performance (estimated)

Max speed 247 mph @ 11,800 ft

Cruising speed (15% power) . . . . . 153 mph @ 10,000 ft

Stalling speed, flap extended . . . . . 75 mph

Takeoff distance at 1.5 G . . . . . 1420 ft

Service ceiling . . . . . 21,300 ft

Capacity

Total cargo volume . . . . . 5750 cu. ft

Total passenger capacity . . . . . 40

Illustrations indicate the general cargo area of the airplane. Considerable construction is seen throughout, with two open, raised cargo bins, and riveted skinning up the R.A.F. 34 wing section.

The wing is set at 15 deg. nose-down in order to allow room at the deck span of 185 mph at 3000 ft. The nose-down is constant along the span, so dictating no expectation of its stability as stability decreases throughout the flight range, despite the use of 2.45:1 taper ratio and virtually no dihedral (94 min).

Future changes would be respectful in this configuration unless it is the intention to put heavier reliance on the powerplants available than we do in this country.

► **Wing Loading**—Arrangement of the fuselage indicates conventional "deep load" profile, in which the aft loading is cut away and the upper wing fillet held straight to clear the landing gear in the rear.

It is to be noted that a bare landing gear has not been provided, although it is readily agreed that the location of the nose wheel as far forward renders this job difficult.

► **Ramp Lock System**—One of the principal design problems with this configuration is the inevitable location of the aft loading ramp longitudinal well at the rear of the main gear section, with the result that very heavy cargo, when loaded, tends to the air brake drum, which then tends to tip the empennage back on its tail.

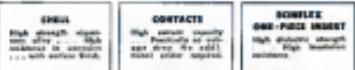
General Aircraft accommodated this

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WRITE DIRECT TO THE SALES DEPARTMENT











## BRIEFING FOR DEALERS & DISTRIBUTORS

**NOT TOO BAD**—Despite dark grey paint with which a lot of people are daubing the outside picture of personal aviation, a poll of the field distributors and manufacturers of the recent Colorado Springs meeting, meeting of Aviation Distributors and Manufacturers Assn., showed that many of them are still "smile" all right.

Some specific quotations:

- **Don Pfeifer, Cessna:** So far, our dollar volume in airplane sales is higher in 1949 than in 1948.
- **W. Scott, Scott Aviation Corp.:** Sales are up 15.5 percent this year for the first five months, with most of the new volume from our new and older customers.
- **Philip Lane, Precision Industries, Houston:** We're doing contracts now for Felt on their Franklin helicopter engine but most of our volume is still in Pratt & Whitney Wasp Jr. engines.

**FAINT CHEERS FOR CGD&B**—Attempt of the ADMA to get its members and customers to use away by telegraphic code isn't working too well judging by the tone printed in the code itself at Colorado Springs. Contractors say that the code is a fine thing if people use it but most aren't taking the trouble.

Manufacturers decided to defer a proposed code system, and save the revision expense, pending further study about the worthwhileness of the whole project. Simple codes:

- **AC&AD:** The account has been charged off as a bad debt.
- **IFNOT—W** not collected we intend to refer to Don & Readmore.
- **DABAL—**Please advise shipping date balance due on our order.

**WHOSE BABY?**—Problem of obsolescence of aircraft supplies has been one of the no man's land between the manufacturer who makes the stuff and the distributor and dealer who stock it, but neither group seemed to want to claim it as the ADMA's department.

Here's a pointer: Jim Goss, manager of the distribution group, proposed a plan for manufacturers to tell local distributor staff with distributors during the last "Group Jamboree" of Southwest Aviation, reported that one manufacturer showed his company an extra discount to cover his responsibility for obsolescence, and that it then became Southwest's responsibility entirely. Some of the manufacturers seemed loath to accept any definite responsibility, although none favored a definite "sober houses" policy.

**DIDGET ORDERS**—Fund lease operator who continually buys any number of airplanes from the distributors are hurting both parties in the transaction. It was concluded at the ADMA meeting, H. E. Wheeler of Buffalo Aerovision Corp. reported that analysis of his orders from the operators showed approximately 75 percent amounted in \$5 or less and that these constituted less than 35 percent of his total dollar volume. Costs were paid by distributor, of purchases of little more than a dollar made by operators who flew in from adjoining towns to get the cost-modified.

Distributors relied on sale of more education needed to get customers to place orders. In answer, ultimate many of the price-modified orders which cost more to handle than the profit involved, and often could be provided by planning.

**ANOTHER TRADE SHIPWRECK?**—Don Bondurant, ADMA president, is mounting out the aviation industry on the claims for another revenue trade show at the next ADMA convention, at French Lick Springs, Ind., Nov. 9-11. Last year's show at the Cleveland ADMA meeting was reasonably successful, mainly principally by a group of conservative scholars of National Aviation Trade Assn., which presented that group from being at show during much of open time.

ADMA would like to have several plane manufacturers get in on the French Lick show if it is held and make it something bigger and better than last year. Invitations will go to the NATA to plan with ADMA in the November meeting.

—ALEXANDER MCGURELLY

several plane field, because it had been felt that Bondurant could not sell its services to other plane manufacturers if it were a distributor. The same association which apply here, to supply houses which required several different plane dealerships, if they, too, took on plane distributorships.

Tom Diven, head of Precision Aviation, Inc., Webster-Salem, N.C., which distributes planes in addition to its supply business, indicated his company had not experienced serious difficulty in using competing other plane dealers.

**Inventory Problems**—Other supply house representatives believed that the extent of inventory required to serve as an accurate distributor could be expected to limit seriously the number of plane dealerships who would undertake to carry such a line.

"The plane distributor will be up against the inventory problem of stock obsolescence and warehouse space that we are," one long independent supplier predicted to AVIATION WEEK. "And, in most cases he will be paying secondary shipment on the inventory business. Meanwhile, his competitor across the airport will be letting us carry his parts and accessories inventory for him, and calling on us for deliveries as he needs them."

"He won't have his capital tied up and can't use it for his main business, selling airplanes."

## Spin Tests Out

Spin tests will no longer be required of civilian pilots effective Aug. 13 as a result of a change made last week by CAB, part 45 of the Civil Air Regulations. The new ruling provides for a reduction of the rotated pilot in case of my foot power and power and still enables him to make a normal attitude.

The subject of spin tests for private pilot licenses has been the subject of controversy for the last two years or more, advocates of eliminating the tests contending that many middle-aged bass fiddle men who might otherwise become pilots are disbarred by the test. It is reported CAB's accident statistics that the only stiff fatalities are these in which pilot was so close to ground that recovery was impossible even if he knew how to recover. Spin test has been compared to tracking a student automobile driver how to rear his car against a wall at a high speed.

Engineers of the spin test on light aircraft design is reported to had to spend many long evenings. Since a large part of the light plane market has been for amateur planes, which had to be spinnable in order to be used as instruction, it is believed that many amateur planes will soon be redesigned as spinproof.

## Torrington Needle Bearings provide compact, rugged design for Curtiss-Wright B-36 propellers



Space is at a premium in the pitch control mechanism of the Curtiss-Wright B-36 propeller used in the B-36 Bomber, too, yet lightweight design and rugged construction Torrington Needle Bearings are used in this mechanism because they provide exceptional compactness and load capacity.



Rotating at 1000 rpm, the drive gear assembly operates efficiently on high capacity Needle Bearings. During pitch change, each bearing carries radial loads of nearly 400 pounds. The full complement of rollers provide a high factor of reliability and assure long service life.



These large gear gear shafts are mounted on Needle Bearings, and bearings are kept relatively small. Stationary during blade pitch operation, these gears need the high static loadcarrying capacity of Needle Bearings—plus the smooth anti-friction operation at 1200 rpm during blade feathering.



Illustration is an example. The load the bearing side close to the shaft and help conserve loadcarrying capacity. The Needle Bearing housing at the left is specially designed for this application to provide compactness and high thrust capacity.



**TORRINGTON NEEDLE BEARINGS**

Needle • Spherical roller • Tapered roller

Straight roller • Ball • Needle rollers

# AIR RESCUE

Over treacherous jungles, deserts and mountains, helicopters of the USAF Air Rescue Service have been in search of stranded airmen and passengers. The helicopters get there because they have been given a "mother" ship—the Fairchild Packet—that transports them over distances far beyond their range. Thus, our Air Force has added a new ability to the versatile Fairchild Packet—increasing the importance of its part in the development of modern airborne military tactics.



Mission of Mercy—for Hawaii personnel, load a helicopter into the spacious cargo hold of a Fairchild Packet.

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Hoover Division, Tompkins, N.Y.

Arbuckle Division, Ronkonkoma, N.Y.  
Dowling Division, Ronkonkoma, New York 22, N.Y.

## AIR TRANSPORT



PASSENGER PLEASE! An end in this modified baggage hold may look like trade off . . .



TPA EXECUTIVES Michael H. King, Roslyn F. Tongg, Alfie A. Frisch and El E. Hart.

## TPA Battles for Hawaiian Traffic

Efforts to sell itself as "people's airline" combat greater experience and equipment of rival Hawaiian Airlines.

Four blue-trimmed DC-3s took to Hawaii's skies earlier this month and ended a 20-year monopoly as use of air transportation's most familiar fields.

With leasing, Roslyn F. Tongg, its president, about one of the planes, Trans-Pacific Airlines, Ltd., began its assault on Hawaiian Airlines, the giant, about 200 DC-3s, several more coming, many rough and ready transports and a bag of tricks of its own. Trans-Pacific has opened the log tower, and both teams scored heavily.

When Hawaiian Airlines reduced its fares to the limit of Trans-Pacific fares, newspaper quoted Stanley King, TPA's traffic manager, as giving tribute to the "obvious desire" of the two airlines "to sell to you TPA is giving the people of Hawaii convenient service at economical rates."

Salutes to Roslyn King. "Our

20 years' service without a passenger or crew injury."

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Salutes to Roslyn King. "Our

time was on a par with Hawaiian Air lines at the start of operations. Now, even, early in 1948, Hawaiian kept it well compelled to mix its fare TPA's fares were not mixed them—and have not been mixed since.

TPA is happy now to have Hawaiian Airlines operating on the same basic fare schedule as TPA. It would otherwise be confusing to the public to have similar air service available at different fares.

When Hawaiian Airlines was the National Safety Council 1945 safety award, TPA president Tongg was quoted as the local press as offering "sincere congratulations" to HAL president Stanley C. Kreslow. Said Tongg: "We shall do our utmost to continue to maintain the high standard of safety as usual as much as we look forward to reaching your excellent record of performance."

► **DC-3 Modified**—Trans-Pacific's DC-3s can carry 25 passengers and the baggage compartment is modified to handle luggage. The conversion was designed by William Russell, TPA's vice president-superintendent, and the company has two conversions. In the major forward open, the main door opens open and no additional entrance into the seating section through a small hinged door which provides in flight access.

The luggage compartment is capable in a series of steps needed to reduce the passenger and establishing Trans-Pacific as "the people's airline."

► **Stock for All**—Trans-Pacific is hand-hair stock ownership. To start its \$1 million capitalization TPA is offering 1 million shares of common stock at par value of \$1 each. So far, no single shares have been sold but blocks of 50 or more being spread out, with stock being sold out to Hawaii residents. TPA apparently believes to prove that a stockholder with 50 or 500 shares will feel like a bigger stockholder than if he held the same 500 shares at \$1 each.

President Tongg, son of a Chinese immigrant laborer, owns some 5 percent of the stock and has effective control of the corporation. There are more than 2300 stockholders, and the service is reaching out far more. Last month, some 54,000 shares had been sold—about 20,000 at \$1, 34,000 under the dollar-a-share plan set up in October.

► **Prospects**—TPA and Hawaiian agree that TPA should catch some 100,000 of the estimated airplane riders in its first year, or perhaps a quarter or a third of the total.

And CAA, as guiding TPA's charter, agreed that (1) it was high time to end the monopoly in Hawaiian transportation, and (2) both lines could operate profitably (AVIATION WEEK, Mar. 7).







of the 1949 model. We have the Agusta with supporting photographs here in the office. These separate prints, the Neons will also be available by request—price \$10.00 for each print.

Getting back to the All-American competition, the Neons reached one out of the top 10. Neons placed 10th, two years old and with 1000 hours logged time. It of course had the 335 hp engine.

All this is the way of getting to the point that we feel you did an excellent job of demonstrating the Neons, while we know the Neons is not the best, probably did not obtain the performance of what the Neons is capable. Interestingly, our records indicate that the engine was Seal 295, built by North American, and was first sold July 1, 1947.

Of course, we feel the Neons' Neons' competitive angle should be recognized to the greatest to the detriment of personal prestige, because, admittedly, these are the two finest planes in the air today, both of which have excellent records for operating efficiency and safety. We consider advantages to the Neons are: low cost— and we know that the Neons, for short field performance, is without a peer. So, in a strictly friendly way will like very much to have W. T. Sloan, continue to our president, step in at Kaufman Airport—wherever he may be—and let him know that you may have for yourself the Neons' truly remarkable qualities. W. T. has very much to have his annual on a short lead with Sloan. I first certain we can guarantee that you will be amazed at the performance of what the Neons is capable when properly flown.

And a word about Gannett and Turner now. They have done a great deal of their North American Neons and have a lot to gain. However, no discussions with the Neons' people have been held on this point. It is our opinion that from Gannett's point of view and not together with our discussions as a result of agreeable terms of a possible agreement between Gannett on the North American Neons which that would be made for a Ryan Neons.

William Warner, Public Relations Manager

Ryan Aeroplane Company  
Lindberg Field  
San Diego 17, Calif.

## Irresistible Urge

We are very much interested to see the paragraph in a recent issue of *Aviation Week* that you are to offer in *The Biplane* by KLM Royal Dutch Airlines. We regret that we have no pictures available which would show you Capt. Antonius Tukker, Office in the Fokker Hotel in Memphis, where we have for some time allowed him a place to chance to sit in our little office chair at a low table while being interviewed.

Frankly every person who has earned the Tukker Office has succeeded to an irresistible urge to sit

Joe Flamm, Publicity  
Captain Airlines  
Detroit 26, Mich.

## SEARCHLIGHT SECTION

### EMPLOYMENT "OPPORTUNITIES" BUSINESS

#### EMPLOYMENT OPPORTUNITIES

#### EMPLOYMENT OPPORTUNITIES</

## STRICTLY PERSONAL

IF YOU'VE TIME TO SPARE—Boycott to Dick Russell's publicity going at United Air Lines for the story of the week. Let Dick tell it; nobody else can do it.

An airline passenger rushed into a UAL San Francisco ticket office the other day clutching a ticket in one hand and a hat in the other.

"Has the reservation for the flight to New York left yet?" he demanded, all out of breath.

Unruffled, the jetset girl replied in her most soothng tones, "No sir. It's just outside the door."

The man rushed out and all was serene for several hours.

Then who should appear at the check-in counter but the same passenger, no longer panting, but with resignation written all over his face.

"I have just," he announced, "had a two-hour wait of Glenshee. What do I do now?"

**FADING PASSENGER PUFFS**—The Delta Dugout confides that Fieldie Flawn, 21, World's fastest communications messenger, retired that same day he had read the telegraph of Delta's reservation he would notice Delta was either canceling, not holding, or reserving about Passenger Puff. Finally, he could sleep easier no longer, and his buzz was very and when about Passenger Puff's Delta's emblem for pickup passengers.

**IT'S A PLANE OF MISSING PARTS**—Although its basic wells were installed to help, we finally got around to telling you that there is or was a good reason why the highly touted Cessna owned by E. W. (Spike) Reed's International Armaments, Inc., at Miami was grounded by parts shortage. This, despite the fact Mr. Reed calls his firm "the finest operations, consulting and purchasing agents" and maintains steadily that the parts were lost in transit, and he's sticking, or is stuck, with the story.

**COMPETITION, IT'S WONDERFUL**—Cloudy White, American White's representative in Providence, says one recent sunny day an American Convair Lear was delayed at Boston by a mechanical. It was bound for Rhode Island State Airport to pick up Providence-bound passengers for New York.

Just as it arrived on the tarmac, Eastern's agent announced promptly over the speaker system EAL's "on time departure" for New York. The Convair captain landed.

En route from Providence to New York he flew the A1 plane past the EAL DC-3 and passed a note back in his paragon. It read about like this:

"We are now east . . . On our left you will see us passing the Eastern Air Lines DC-3 which left Providence 10 minutes before we did. We will arrive in New York at least five minutes before the Eastern plane. We hope you enjoy your ride and will be with us again."

**SKIRT, SHORT STORY**—Book Left, we see no longer editor at our printer in Albany, who for more short paragraphs in this column can be put together more. So we repeat that Skirt Airways News quotes this description on a competing news report: "She ate steak in company uniforms. Skirt my teeth."

**CONTRIBUTIONS WANTED**—This column sends your whizbang contributions. It does not write itself. Help, help! Address American White, 150 West 45th St., New York 15, N. Y. Contributions will be paid absolutely nothing.

**BITS OF HISTORY**—E. C. Spangler, Viking first officer, comes through with some bite. Says he:

"Ah, Deafie Stride (famous old time Rutherford Oil Co. pilot) if he remembers the time he landed his Waco Steamer at State Bank airport during an air race and, in opening his baggage compartment, found a steamer or money bag in a box. On the box was written: 'This is Oscar. That boy has like a brother'."

"Ask Glass Messier, old timer from down Beaufortian way, if he remembers the true name of those who were up together one day 'slipping around a little' when some patriotic plaster in the back seat cracked a thin wooden box with his tool so they were making a sharp pull up. Oh, brother!"

## WHAT'S NEW

### Trade Literature

"Follow Me, A Guide for Selling to the United States Air Force," interested particularly to us small concerns that have not previously established relationships with the armed forces, available upon request to Commanding General, Air Materiel Command, Wright-Patterson AFB, Dayton, Ohio. Price, \$1.50. Printed in two divisions. Also available, "Selling to the Navy," from Superintendent of Documents, Government Printing Office, Wash 25, D. C., price 15 cents. "Purchased Items and Purchasing Locations," upon request to Procurement Information Center, Office of the Assistant Secretary of the Army, The Pentagon, Wash 25, D. C.

"Lightplane Tires on Test and Complete," with a series of leaflets, available on request to University of Illinois Institute of Aviation, Urbana, Ill.

"The Inside Story," a booklet on "safety circle" aircraft protection, available at Allis-Chalmers dealers.

"National Politics," a booklet describing and illustrating many types of wooden planes available on request to National Putter Corp., Oliver Building, Pittsburgh 22, Pa.

"USCON Reed Fluids and Lubricants," describing products and their uses, available on request to Charles and Charles Corp., 30 E. 47 St., New York 17, N. Y.

"Catalog 1949," a list of books and periodicals selected to be published during the year by International Publishers, Inc., 215 Fourth Ave., New York 3, N. Y.

"Books for Seafarers and Earth Folk 1949," a listing of books from Wilson Marrow & Co., Inc., 425 Fourth Ave., New York 16, N. Y.

"Industrial Air Power Catalog," covering products which utilize air power, available upon request to Metal Specialties Co., 4114 North Kinn Ave., Chicago 45, Ill.

"Solekin 994," describing O-rings specially compounded for strength use in sealing fuel systems, available upon request to The Parker Appliance Co., 1733 Euclid Ave., Cleveland 12, Ohio.

### New Books

"Principles of Wage and Salary Administration," by A. W. Jackson, 178 pages, clothbound, indexed. Published by National Research Institute, Dept. River, Conn., price \$2.50.

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